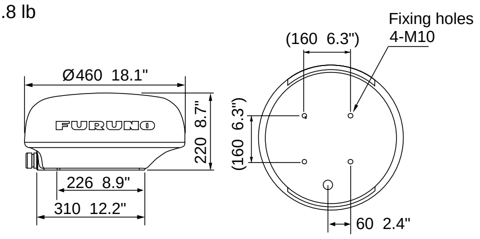
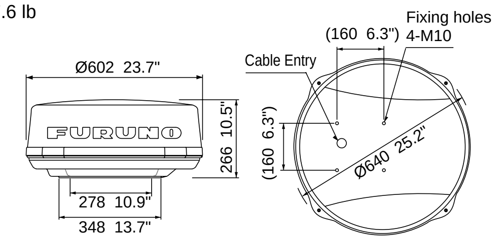
Specifications of NavNet vx2

NAVnet vx2

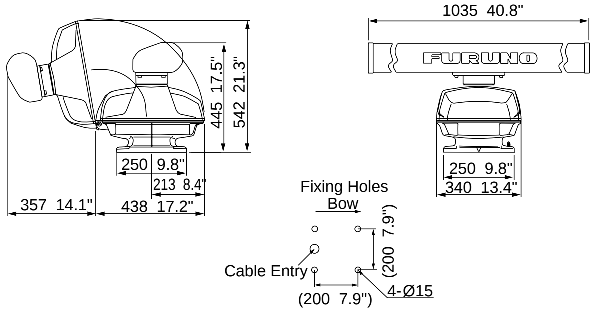
18" Radome Antenna
4.9 kg 10.8 lb



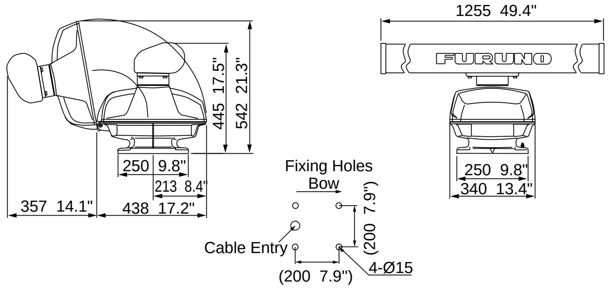
24" Radome Antenna
8 kg 17.6 lb



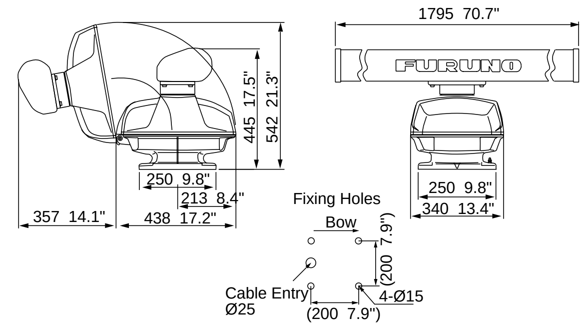
3.5 ft Open Antenna
22 kg 48.5 lb



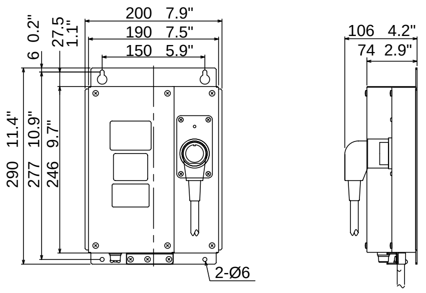
4 ft Open Antenna
23 kg 50.7 lb



6 ft Open Antenna
25 kg 55.1 lb



Power Amp Unit
PSU-005 for MODEL 1954C/1954C-BB
1.9 kg 4.2 lb





Ethernet is a trademark of Xerox corporation, registered in U.S. and other countries. Navionics® is a trademark of Navionics®, registered in U.S. and other countries. Smart Sensor™ is a trademark of AIRMAR, registered in U.S. and other countries.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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NAVnet® vx2

The future today with FURUNO's electronics technology.

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Fax: +81 (0)798 65-4200, 66-4622 URL: www.furuno.co.jp

Catalogue No. R-189a

The highest ac claimed navigation system just got better, introducing NavNet vx2!



10.4" Color LCD



7" Color LCD

Since its release back in 2001, FURUNO's NavNet series has been enjoying unrivalled popularity worldwide for its high reliability, performance and expandability. It has even been voted Best Integrated Navigation System by the National Marine Electronics Association for three consecutive years. Now, NavNet vx2 is ready to carry on the tradition.

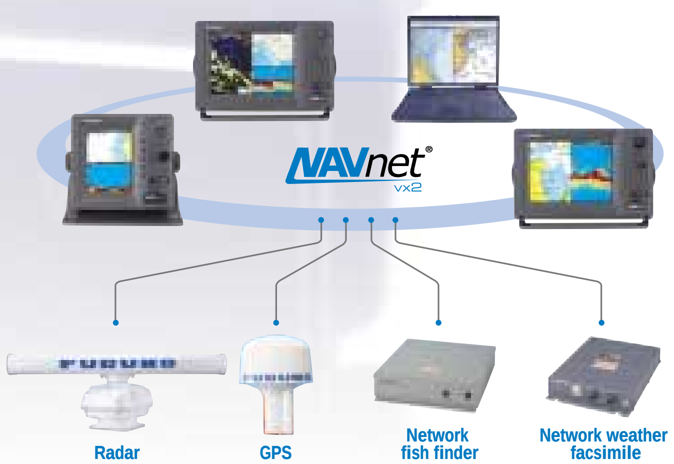
NavNet vx2 combines radar, GPS/WAAS chart plotter, fish finder, and network weather facsimile into completely integrated navigation network. Its wide range of options fulfils virtually every desire you may have for your navigation system.

- *All display units are capable of controlling any component connected to the NavNet network*
- *Perfect for single or multi display installations*
- *Fully supports C-Map NT MAX and Navionics® GOLD chart.*
- *Utilizes SD cards for chart and memory.*
- *Fast chart drawing speed.*
- *Straightforward "Plug 'n Play" installation with wizard style set-up.*
- *AR-coated, high-brightness display unit for improved sunlight viewability.*

NavNet vx2 network capability

From a stand-alone, single station navigation system to a multistation integrated navigation network, NavNet vx2 lets you build your navigation system according to your needs. Utilizing state-of-the-art network technology, NavNet vx2 provides you with seamless data sharing and vast future expandability.

The heart of NavNet vx2 is its Ethernet-based network that allows multiple displays to be connected. Choose from the 7", 10.4" and the flexible BlackBox, that allows you to match it with virtually any display including our ultra bright 12" and 15" monitors. Interconnect the displays with various navigational sensors and our new MaxSea-NavNet navigational software for a feature rich network that is unparalleled. Stress-free navigation and operation of any component can be performed from any display unit connected to the onboard network.







NAVnet® vx2

Building a NavNet vx2 system

Select your display units

You can select your display units for NavNet vx2 from the following: 7", 10.4", 12" and 15" high-brightness LCDs. You can choose either a single- or a multi-station system of up to four displays.

7"



10.4"



12" with BB unit



15" with BB unit



Select additional components

Once you have selected the display units for your system, you can now choose the basic operating equipment of the NavNet vx2 system. NavNet vx2 has four main components including radar, GPS/WAAS chart plotter, fish finder and weather facsimile to create your navigation network. You can create your own network by selecting components according to your needs.

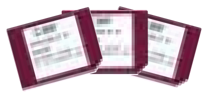
Radar antenna



GPS/WAAS antenna

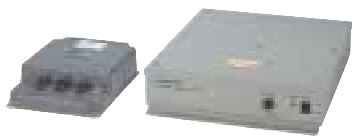


Chart cards



· *C-Map NT MAX*
· *Navionics® GOLD*

Network fish finder



Network weather facsimile



Compliment your system with additional FURUNO equipment

With a variety of optional add-ons, NavNet vx2 can offer you additional useful functions, such as: radar overlay, AIS display, NAVpilot autopilot data and ARPA target tracking. You can even interface it with your PC and MaxSea-NavNet PC software to make it the most versatile navigation network on the market.

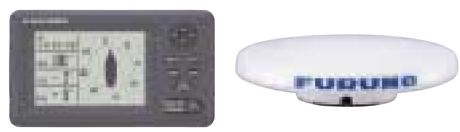
PC software
MaxSea-NavNet



Autopilot
NAVpilot series



Heading sensor
SC-50/110
PG-500



Nav data organizer/Remote display
RD-30



AIS
FA-100

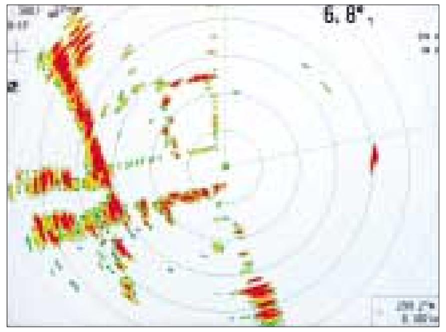




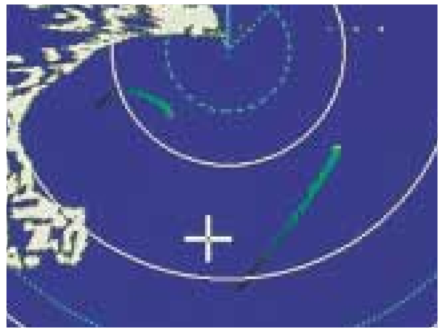
NavNet vx2

Radar

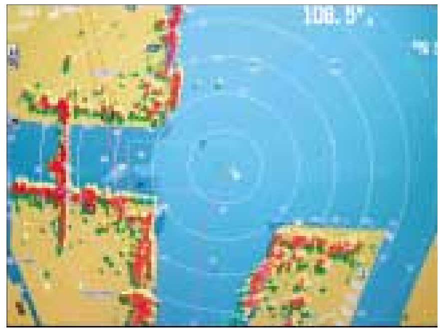
High-performance radar is one of the main components of NavNet vx2. Known for our award winning and reliable radars, the NavNet vx2 radar includes the following features:



- Presentation modes selectable from: North-up, Head-up, Course-up and True Motion
- Overlay radar targets on chart (appropriate heading sensors required, i.e. PG-500, C-500, SC50/110, etc.)
- Auto gain control
- Echo trail shows an afterglow of moving radar targets
- Automatic radar plotting to track up to ten targets (Not available on stand-alone 7" models, unless part of a network incorporating 10.4" or BlackBox models with ARP-11 installed.)
- Radar Guard Zone alerts you to potential danger
- Energy saving Watchman feature
- Dual EBL (Electronic Bearing Lines) and dual VRM (Variable Range Markers) give distance and bearing to targets
- Off-center display allows you to focus on a specific area
- Customizable color presentation for night-time operation

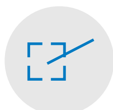


Echo trails
This feature displays afterglow of all the targets to show their tracks. It helps you foresee their heading directions at a glance. Its trail duration is adjustable among 15, 30 s, 1, 3, 6, 15, 30 min and continuous.



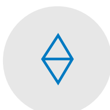
Radar overlay
Radar targets can be overlaid onto the electronic chart so that you can better recognize what's around your vessel by referencing the target locations on both the chart and the radar.

Automatic radar plotting (ARP)
Up to ten targets can be simultaneously acquired and tracked to show you the heading direction and speed of the targets.


Initial stage


Steady tracking


CPA alarm


Lost target

NavNet vx2
Radar



NAVnet vx2



Radar antennas

NavNet vx2 presents a wide range of radar antennas that offer unparalleled performance to suit a variety of your needs. Powerful X-Band transmitters offers detailed target detection. While the compact 2.2 kW and 4 kW radomes offer the maximum range of 24 and 36 nm respectively. High performance open arrays offer longer detection ranges.

Open antennas
- Selectable from 4 kW (3.5'), 6 kW (4'), 12 kW (4/6') and 25 kW (4/6') models
- Narrow horizontal beam width enhances target identification and ensures detection of smaller targets
- Longer range scales of up to 72 nm
- High power output for enhanced long range performance

Radomes
- Selectable from 2.2 kW (18") and 4 kW (24") models
- Stylish, compact and lightweight units
- Simplified installation
- Modest power consumption

Radar antenna selection

		Open antennas						Radomes	
Output power		4 kW	6 kW	12 kW	12 kW	25 kW	25 kW	2.2 kW	4 kW
Size		3.5 ft	4 ft	4 ft	6 ft	4 ft	6 ft	18 inch	24 inch
Beam width	Horizontal	2.2°	1.9°	1.9°	1.2°	1.9°	1.2°	5.2°	3.9°
	Vertical	22°	22°	22°	22°	22°	22°	25°	20°
Maximum range		48 nm	64 nm	72 nm	72 nm	72 nm	72 nm	24 nm	36 nm
Optional 48 rotation		Available*	Available*	Available	N/A	Available	N/A	N/A	N/A

*BlackBox models only



NavNet vx2

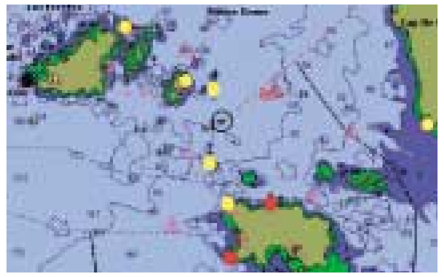
GPS/WAAS Chart Plotter

Working in perfect collaboration with the NavNet vx2 radar is the GPS/WAAS chart plotter. It shows your exact position and offers a variety of display modes that allow you to organize your nav data with unparalleled ease.

C-Map NT MAX chart

NavNet vx2 accepts the C-Map's new NT MAX charts. The NT MAX unique features include live nav-aids, tidal flows, local street maps, photographs of harbors and perspective view in addition to grounding alarm (Guardian Technology™).

Live nav-aids (Flashing buoys/Light houses)



Flashing buoys and light houses are displayed with only visible sector colors according to boat's position.

Tidal flows



Intuitive arrows show direction and strength

Local street maps



Coastal roads, land elevation contours, airports and other land objects included in major port areas.

Photographs of harbors



Photographs of major harbors and nav-aids are included

Perspective view



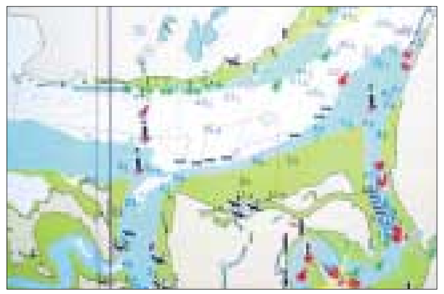
Grounding alarm (Guardian Technology™)



Continuously scans the chart data in front of the boat to detect dangerous objects (land, rocks,..).

Navionics® GOLD chart

Navionics® GOLD charts offer "object-oriented" color rich presentation with superior clarity and detail. The "Xplain" feature translates every navigational symbol into an easy to understand description. The IC™ (Intelligent Clarity) feature that automatically filters on-screen presentation at every zoom level to offer a clear, uncluttered display of all essential nav data.



NavNet vx2

GPS/WAAS Chart Plotter



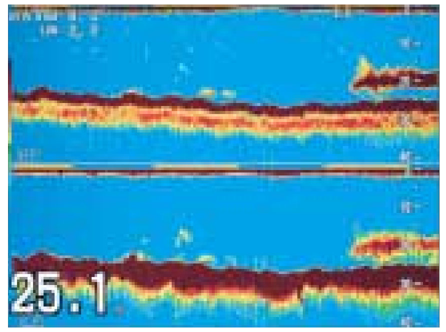


NavNet vx2

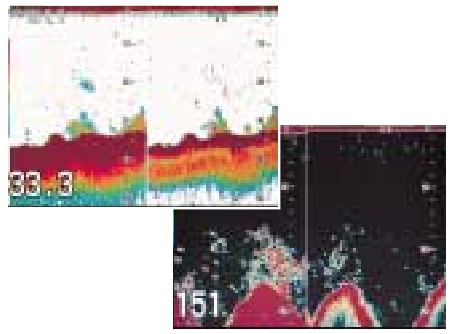
Fish Finder

For years, Commercial Fisherman have relied on FURUNO's fish finding technology to help them make a living. FURUNO's network fish finders implement the same tried and true fish finding technology that is used in our commercial-grade fish finders. Plug a network fish finder into your NavNet vx2 system and it turns any display in the network into a high-performance fish finder.

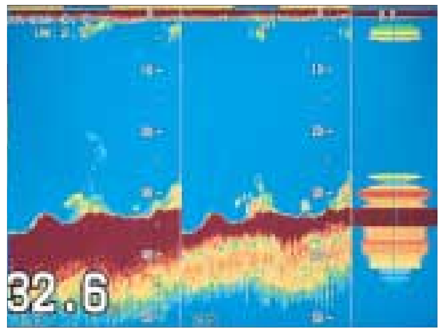
- Variety of presentation modes: Marker Zoom, Bottom Discrimination, Bottom Lock Expansion, A-scope and many more
- FURUNO Free Synthesizer (FFS) transceiver on the ETR-30N allows you to choose any two operating frequencies from 28 to 200 kHz
- Two selectable automatic gain control modes: Cruising and Fishing modes to match your style of boating
- Wide output power range selectable from regular 600 W to powerful 3 kW
- Two pages of fish finder images can be stored and displayed



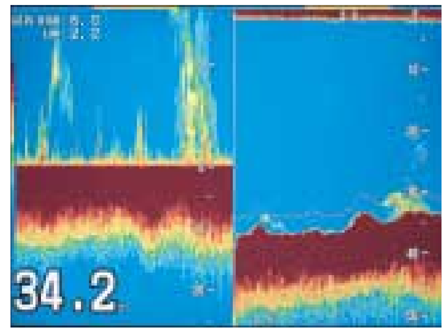
Dual-frequency (Vertical split)



Dual-frequency (Horizontal split)



Dual-frequency with A-scope



Bottom discrimination

NavNet vx2

Fish Finder



FURUNO Free Synthesizer (FFS)

The ETR-30N employs the FURUNO Free Synthesizer based on the professional fish finder FCV-1200L, which allows you to operate a fish finder in any two operating frequencies from 28 to 200 kHz without a matching box. This transceiver gives you the flexibility to choose your operating frequencies for more productive fishing. Output power can also be selected among 1, 2, and 3 kW to suit a variety of situations.

NavNet vx2

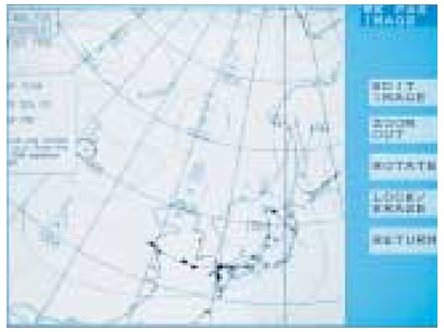
FAX, AIS & NAVpilot



Network weather facsimile receiver

The network weather facsimile FAX-30 receives weather map images and NAVTEX messages. The images and messages can be displayed on the 10.4" or BlackBox models.

- Up to 12 pictures can be stored in memory
- Programmed with all currently existing facsimile stations and frequencies: up to 320 channels storable
- Presentation in monochrome, 16-gradation gray scale or color (three patterns of color presentation are available)
- Built-in NAVTEX receiver (490 kHz and 518 kHz) in which up to 130 messages can be stored



Weather map



NAVTEX



Satellite image

Interface with AIS

NavNet vx2 lets you integrate AIS (Automatic Identification System) into the network with an optional component. Information for up to 100 AIS targets can be displayed on any networked unit. This integration provides you with a solution for observing other vessels. (AIS receiver required)

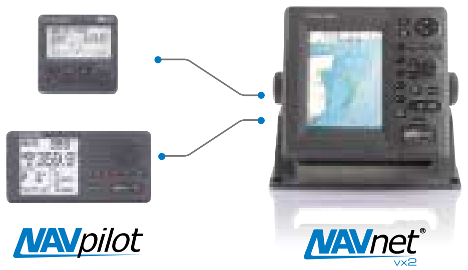
- Display up to 100 AIS equipped targets information (the information is displayed in the AIS data cell)
- Indicate the state of targets with five symbols



Sleeping AIS Target | Activated Target | Selected Target | Lost Target | Dangerous Target

Interface with the NAVpilot

When the NAVpilot is added onto the network, you can set the destination and course to steer on the plotter mode, and transfer the course information to the NAVpilot. The NAVpilot will do the rest, steering your craft automatically to the destination. You can set the course and steer your craft from the NavNet vx2.



NavNet vx2

FAX, AIS & NAVpilot



NAVnet® vx2



Presentation

NavNet vx2 offers a wide variety of display combinations to provide you with what you are looking for in various situations. There are over 50 combinations ensuring the right display for the right situation. Selecting a mode is easy with the display menu window.

- Display multiple functions simultaneously with two-way and three-way split screen presentations
  - · Three-way split-screen presentation available on 10.4" or BlackBox models
  - · Two-way split-screen presentation available for all models
- Analog RGB output available on 10.4" models
- NTSC/PAL interface available for displaying TV/VCR/DVD on 10.4" models (Standard on BlackBox models)
- Favorite snapshot displayable as wallpaper
- 256 colors enhancing “Look & Feel” of presentations

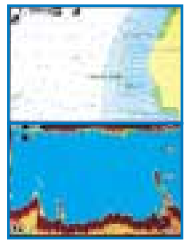


User programmable HotPages
There are six user programmable modes (five for 7" LCD) to allow you to customize your favorite displays with just a few key strokes.

Rotary encoder

Two-way split (7")



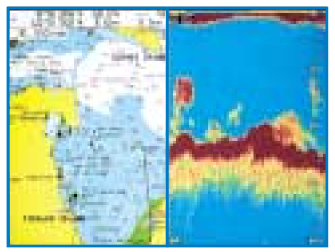


Nav data at the top of the display
Simple nav data cell at the top of the display.



Two-way split (10.4", BlackBox)

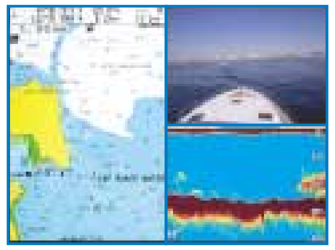


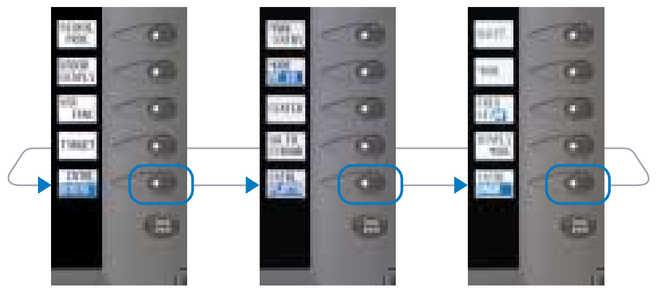


Function keys alongside the screen
Five soft keys are placed alongside the screen to allow you to operate virtually all the functions of NavNet vx2. With these keys, you can select and control each operation mode. All of the controls can be accessed intuitively by using the soft keys.

Three-way split

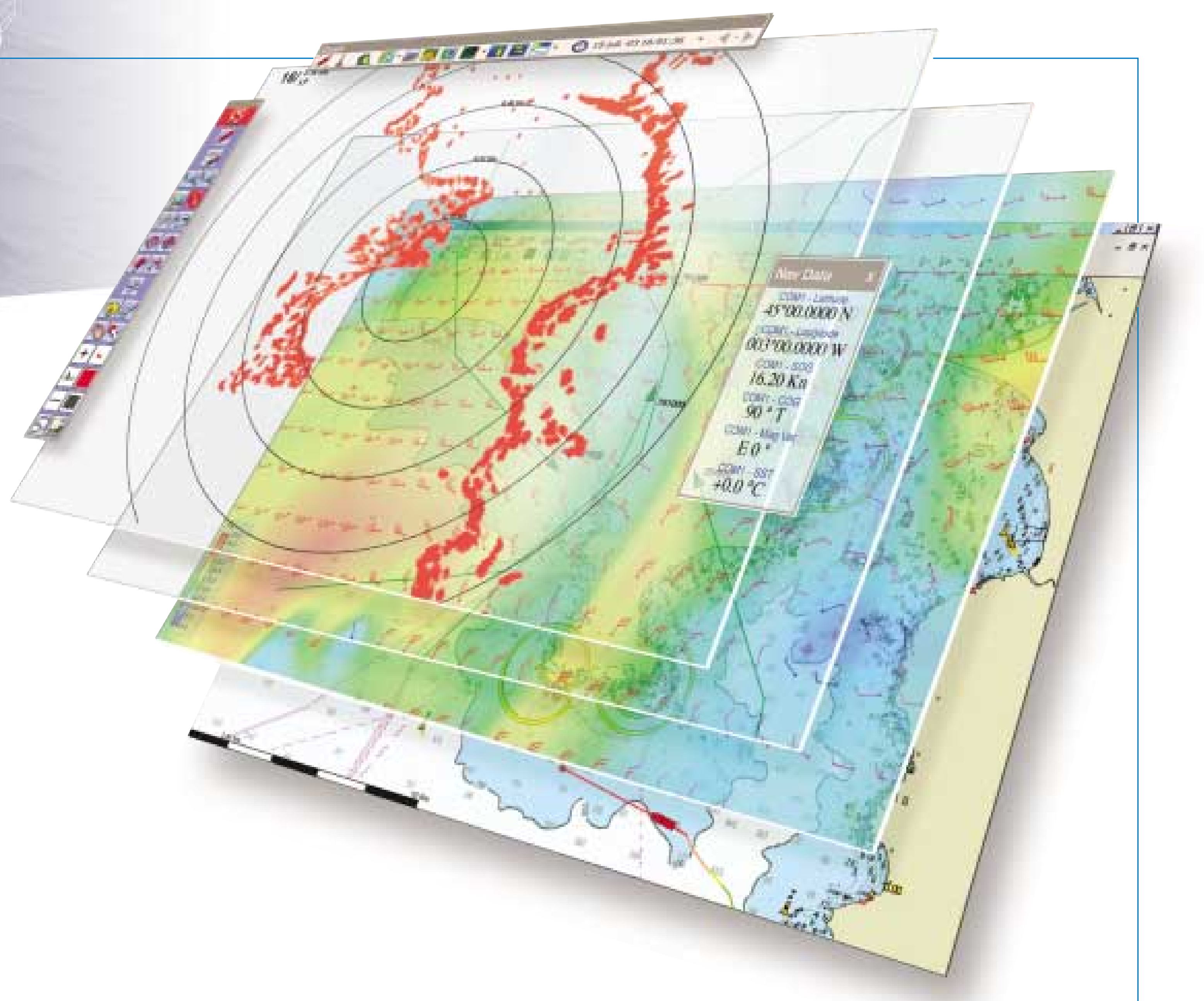






Radar | Plotter | Sounder





MaxSea-NavNet PC software

Defining the cutting-edge of applied information technology, MaxSea-NavNet software is a powerful navigation tool for boaters who are looking for a user-friendly interface and a more comprehensive navigation system.

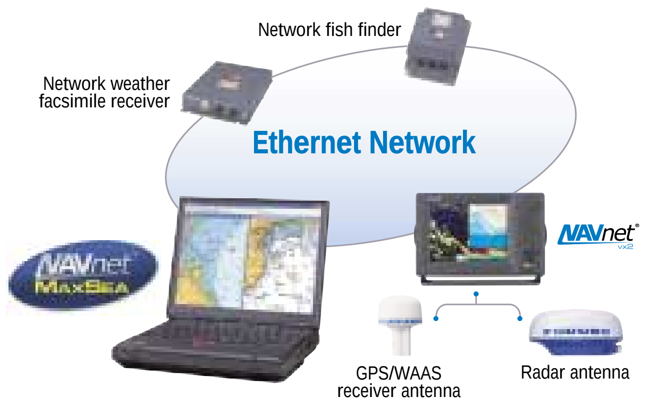
MaxSea-NavNet software offers increased efficiency at sea by using its exclusive capabilities, such as seamless chart displays, advanced weather forecast overlay, real-time three dimensional images of the seabed (Personal Bathymetric Generator) and many more. Intuitive operation of MaxSea-NavNet is achieved by its user-friendly interface and graphical tool palette. MaxSea-NavNet presents the ultimate solution to navigational data management.

- **Sharing C-Map NT chart data as well as all the navigation data within the NavNet network**
  NavNet provides MaxSea-NavNet with radar, fish finder and essential navigation data from various networked sensors.
- **Full control of NavNet**
  MaxSea-NavNet offers full control of the NavNet display, such as radar range, gain/STC control, etc., in addition to handling the navigation data to display in a diverse range of formats.
- **2D/3D ground discrimination function allows boaters to see the Bottom Roughness, Hardness and Classification overlaid with MaxSea 2D/3D charts***
- **3D chart data conversion with C-Map NT chart***
- **ARPA radar target tracking capability***
- **AIS transponder compatibility***

* Optional modules that may require additional equipment

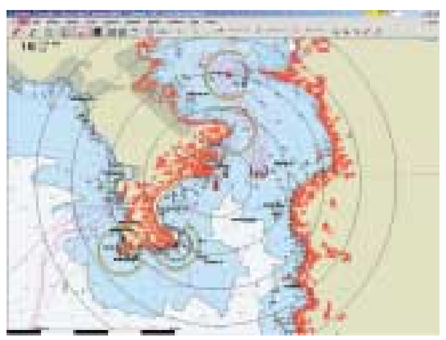
Interface with the NavNet system

The MaxSea-NavNet software is capable of combining and analyzing data from multiple sources in real-time. Fully integrated into the NavNet system through a high-speed Ethernet network, MaxSea-NavNet facilitates the complete integration between the PC and the NavNet network, sharing information from the radar, GPS, echo sounder and other nav data within the NavNet system. A variety of display orientations can be selected to meet your needs.



MaxSea-NavNet radar overlay

MaxSea-NavNet provides the highest quality electronic charts available as the basis for its radar overlay. MaxSea-NavNet overlays the full radar image at the same scale and creates a dramatic improvement in accuracy and clarity. MaxSea-NavNet radar overlay gives you amazingly detailed images. The range of color and transparency of the overlay guarantees that the chart is not hidden. This allows for the confirmation of precise positioning relative to the chart and clearly reveals any inconsistencies.



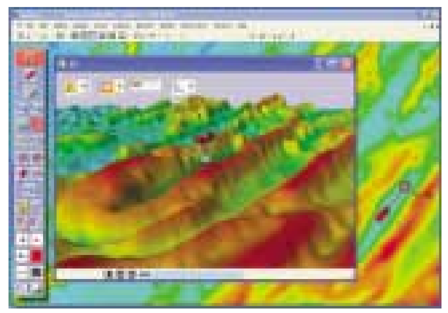
The unique overlay system optimizes data visualization

Using MaxSea-NavNet's multiple "overlay" system, various layers of information can be superimposed on the screen. Each overlay contains different types of data, such as tracks, marks, hazards, wrecks, ports, currents, water temperature, etc. Based on the needs of the moment, a single click can make each layer visible or invisible, eliminating irrelevant information and clearly showing objects of interest.



Optional Personal Bathymetric Generator (PGB) clearly shows the contours of the bottom

Connected to the network sounder and GPS, MaxSea-NavNet PBG records the position and the depth as your boat proceeds, which enables you to create 2D and 3D charts with pinpoint accuracy in real-time. With a single click, MaxSea-NavNet PBG will be activated to give breathtaking real-time 2D and 3D images of the seabed.



SYSTEM REQUIREMENTS

Your PC must meet the following system requirements in order to work with MaxSea-NavNet. Please verify these requirements before installing.

- Windows® 2000 or XP
- 800 MHz processor
- CD-ROM drive – for installing MaxSea-NavNet
- Serial or USB port(s) – for connecting navigation equipment (An adapter must be used for USB connections – see the section on connecting equipment for more information.)
- 700 MB of hard drive space
- Graphic card: 32 MB (64 MB recommended)
- Network facility required
- Memory requirements:

Operating	System Memory
Windows® 2000	64 MB (128 MB recommended)
Windows® XP	128 MB (256 MB recommended)

- Note about system requirements:
  For the best performance we advise you to follow the 'recommended' guidelines. MaxSea-NavNet is an advanced software program which makes good use of faster computers with more memory.

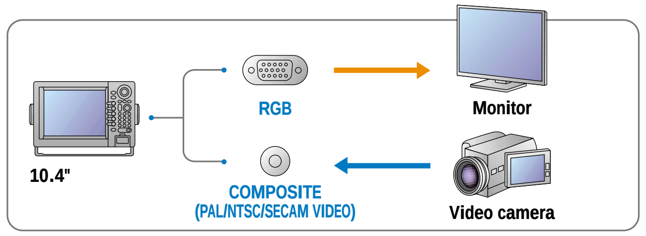
Display unit

10.4"/7" display unit

NavNet vx2 provides you with a multi-station option for your navigational requirements. Two types of display units are available: 10.4" and 7" high brightness, sunlight viewable LCD's. Excellent all-round presentation with a wide viewable angle, VGA screen resolution ensures a superbly detailed picture.

- High-brightness LCD viewable under direct sunlight
- Enhanced visibility with Anti-Reflective (AR) coating to cut down annoying glare
- Common user interface for compatibility among the display units networked
- Easy operation using a trackball* and rotary encoder (*for 10.4" models)
- Multi-station networking of up to four display units
- Simple connection between each sensor and display unit
- Analog RGB video output available for remote monitoring (for 10.4" models)
- NTSC/PAL input available for displaying video images from onboard TV/VCR/DVD player (for 10.4" models)





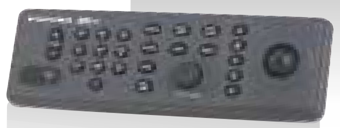
12"/15" LCDs with BlackBox unit

FURUNO MU-120C/155C LCD units can be used as display units for BlackBox models. When connected to BlackBox models, the MU-120C/155C offers the same functions as the 10.4" display unit on top of its exclusive functions. BlackBox models also can work with commercial monitors.

- Picture-in-Picture (PIP) function to display a small image window on top of the main display
- Built-in scaler to accept up to SXGA screen resolution*
  *With NavNet vx2, the display unit display the images in VGA resolution
- Easy channel selection
- Waterproof, low profile unit for flexible installation



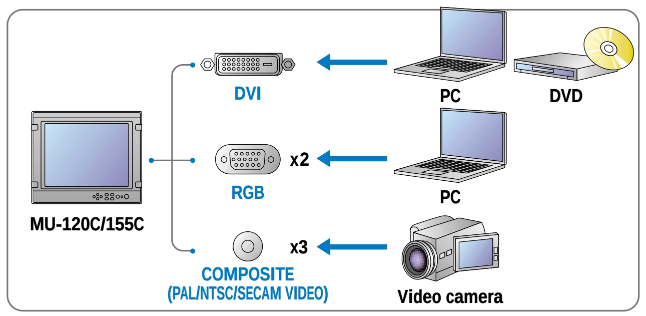
Photo: MU-155C



Control unit for BlackBox models



Processor unit for BlackBox models





Network sensors

Whether it is the radar and GPS/WAAS antennas that connect directly to the NavNet vx2 displays or the optional network sensors that connect through the Ethernet network, all of the data obtained from each sensor can be shared by every display on the network. The beauty of NavNet vx2 is that you can start with a single unit and expand its features as needed.

Radar antenna

Each NavNet vx2 radar comes with a commercial-grade FURUNO antenna. The output power of the antenna units ranges from the sleek 2.2 kW radome to the powerful 25 kW open array.

GPS antenna

Simply by plugging the GP-320B GPS/WAAS receiver antenna into any NavNet vx2 display, all the displays networked can show highly accurate position data.



Network fish finder

The network fish finder can be plugged into any display or a Hub to turn the NavNet vx2 display into a high-performance dual-frequency fish finder.

ETR-6/10N-BBFF1

Frequency: Dual-frequency 50/200 kHz
Output Power: 600 W/1 kW rms
Basic Range: 8 range scales to 2,500 ft

ETR-30N-BBFF3

Frequency: Dual-frequency selectable from 28/38/50/88/107/200 kHz
Output Power: 1/2/3 kW rms
Basic Range: 8 range scales to 3,600 ft

Network weather facsimile

The FAX-30 is a network weather facsimile receiver that works with 10.4", BlackBox models or a PC to display weather maps, satellite images, NAVTEX and other navigation information.

Specifications of NavNet vx2

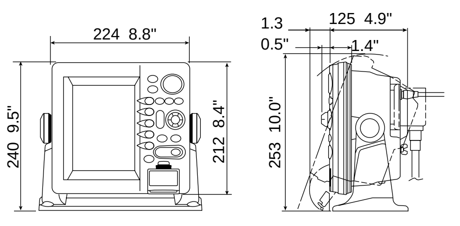
7" Color LCD Radar / Chart Plotter



	MODEL 1724C	MODEL 1734C
DISPLAY UNIT		
1. Type	7" Color TFT LCD, VGA 480 x 640 pixels	
2. NavNet Interface	Ethernet 10-BaseT	
3. Interface (NMEA 0183 format)	Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG	
4. Language	English, French, Spanish, German, Portuguese, Italian, Danish, Norwegian and Swedish	
RADAR CHARACTERISTICS		
1. Display Modes	Head-up, Course-up*, North-up*, True Motion** (* Heading input required ** Heading and speed inputs required)	
2. Range Scales (nm)	0.125 to 24 nm 14 steps	0.125 to 36 nm 15 steps
3. Echo Trail	Interval: 15 s, 30 s, 1 min, 3 min, 6 min, 15 min, 30 min or Continuous	
PLOTTER CHARACTERISTICS		
1. Map Scale	0.125 to 2,048 nm	
2. Latitude Limits	Between 85°N and 85°S	
3. Plot Interval	1 s to 99 min 99 s or 0 to 99.99 nm	
4. Display Modes	Course plot, Nav data, Steering display, Highway	
5. Presentation Modes	TM/RM North-up, Course-up, Auto Course-up	
6. Memory Capacity	Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route	
7. Alarms	Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network sounder required, temperature sensor required for water temperature alarm ** C-Map version only)	
8. Electronic Charts	C-Map NT MAX or Navionics® GOLD	
ANTENNA RADIATOR		
1. Type	Ø460 mm (18") Radome	Ø602 mm (24") Radome
2. Rotation Speed	24/30 rpm (Automatic switch)	24 rpm
3. Wind Load	Relative wind 100 kt	
4. Beamwidth	Hor: 5.2° Vert: 25°	Hor: 3.9° Vert: 20°
RF TRANSCEIVER		
1. Peak Output Power	2.2 kW	4 kW
2. Frequency	9410 ± 30 MHz (X-Band)	
3. Pulselength & PRR	0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/600 Hz (3 to 48 nm)	
ENVIRONMENT (IEC 60945 test method)		
Temperature	-15°C to +55°C (Display Unit) -25°C to +70°C (Antenna Unit)	
Waterproofing	IEC 60529 IPX5, USCG CFR-46 (Display Unit) IEC 60529 IPX6 (Antenna Unit)	
POWER SUPPLY		
	12-24 VDC	12-24 VDC
	75 W	75 W
	115/230 VAC with optional rectifier PR-62	
Power Amp Unit	Not required	
Optional unit		
Antenna Bracket	OP03-93	OP03-92
10-Target Autoplotter	Full control when networked with 10.4" LCD, BB system and ARP-11	
External Buzzer	OP03-136 or Relay/Contact Closure	
NTSC/PAL Interface kit	Not available	
RGB Output Cable kit	Not available	
AIS Interface Unit	Available	

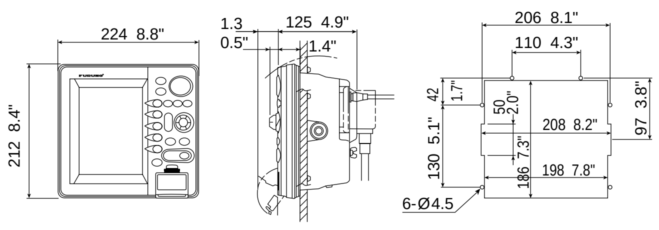
7" LCD (Bracket Mount)

3.5 kg 7.7 lb



7" LCD (Flush Mount)

3.2 kg 7.1 lb



10.4" Color LCD Radar / Chart Plotter — BlackBox Radar / Chart Plotter



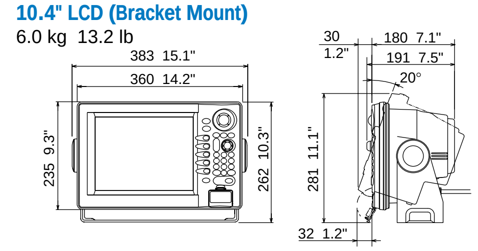
BlackBox Radar / Chart Plotter



	MODEL 1824C/-BB	MODEL 1834C/-BB	MODEL 1934C/-BB	MODEL 1944C/-BB	MODEL 1954C/-BB	MODEL 1964C/-BB
DISPLAY UNIT						
1. Type	10.4" Color TFT LCD, 640 x 480 pixels (Multi-sync monitor Required on BlackBox system)					
2. NavNet Interface	Ethernet 10Base-T					
3. Interface (NMEA 0183 format)	Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG					
4. Language	English, French, Spanish, German, Portuguese, Italian, Danish, Norwegian and Swedish					
RADAR CHARACTERISTICS						
1. Display Modes	Head-up, Course-up*, North-up*, True Motion** (* Heading input required ** Heading and speed inputs required)					
2. Range Scales (nm)	0.125 to 24 nm 14 steps	0.125 to 36 nm 15 steps	0.125 to 48 nm 16 steps	0.125 to 64 nm 17 steps	0.125 to 72 nm 18 steps	
3. Echo Trail	Interval: 15 s, 30 s, 1 min, 3 min, 6 min, 15 min, 30 min or Continuous					
PLOTTER CHARACTERISTICS						
1. Map Scale	0.125 to 2,048 nm					
2. Latitude Limits	Between 85°N and 85°S					
3. Plot Interval	1 s to 99 min 99 s or 0 to 99.99 nm					
4. Display Modes	Course plot, Nav data, Steering display, Highway					
5. Presentation Modes	TM/RM North-up, Course-up, Auto Course-up					
6. Memory Capacity	Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route					
7. Alarms	Guard Zone, Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network Sounder required, temperature sensor required for water temperature alarm ** C-Map version only)					
8. Electronic Charts	C-Map NT MAX or Navionics® GOLD					
ANTENNA RADIATOR						
1. Type	Ø460 mm (18") Radome	Ø602 mm (24") Radome	1035 mm (3.5 ft) Open	1255 mm (4 ft) Open	1255/1795 mm (4/6 ft) Open	
2. Rotation Speed	24/30 rpm (Automatic switch)	24 rpm			24/48* rpm	
*48 rpm is option — BB	24/30 rpm (Automatic switch)	24rpm	24/48* rpm (*Not available in 6 ft)			
3. Wind Load	Relative wind 100 kt				Relative wind 100 kt (24 rpm) Relative wind 70 kt (48 rpm)	
4. Beamwidth	Hor: 5.2° Vert: 25°	Hor: 3.9° Vert: 20°	Hor: 2.2° Vert: 22°	Hor: 1.9° Vert: 22°	Hor: 1.9/1.2° Vert: 22°	
RF TRANSCEIVER						
1. Peak Output Power	2.2 kW	4 kW	4 kW	6 kW	12 kW	25 kW
2. Frequency	9410 ± 30 MHz (X-Band)					
3. Pulselength & PRR	0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/600 Hz (3 to 64 nm)				0.08 µs/2100 Hz (0.125 to 1.5 nm) 0.3 µs/1200 Hz (1.5 to 3 nm) 0.8 µs/500 Hz (3 to 96 nm)	
ENVIRONMENT (IEC 60945 test method)						
Temperature	-15°C to +55°C (Display unit) -25°C to +70°C (Antenna unit)					
Waterproofing	IEC 60529 IPX5, USCG CFR-46 (Display unit) IEC 60529 IPX6 (Antenna unit)					
POWER SUPPLY (at relative wind 100 kt)						
	12-24 VDC	12-24 VDC	12-24 VDC	12-24 VDC	12-24 VDC	12-24 VDC
	90 W	90 W	110 W	115 W	125/150 (24/48 rpm, 4 ft), 130 W (6 ft)	138/153 (24/48 rpm, 4 ft, 163 W (6 ft)
BB	60 W	60 W	80/100 W (24/48 rpm)	85/105 W (24/48 rpm)	100/120 (24/48 rpm, 4 ft), 100 W (6 ft)	107/122 (24/48 rpm, 4 ft), 132 W (6 ft)
	115/230 VAC with optional rectifier RU-3423/1746B-2					
Power Amp Unit	Not required				PSU-005	PSU-008
Optional unit						
Antenna Bracket	OP03-93	OP03-92	Locally arranged			
10-Target Autoplotter	ARP-11* (* Requires appropriate heading sensor)					
External Buzzer	OP03-136 or Relay/Contact Closure					
NTSC/PAL Interface kit	OP03-175 (Supplied as standard on BlackBox system)					
RGB Output Cable kit	OP03-176					
AIS Interface Unit	Available					

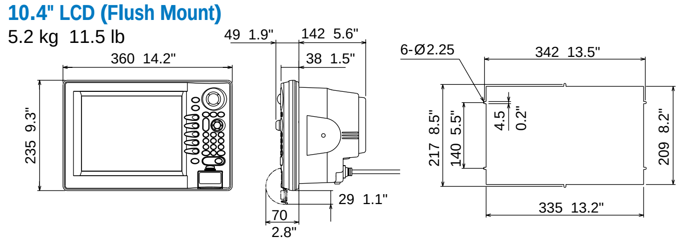
10.4" LCD (Bracket Mount)

6.0 kg 13.2 lb



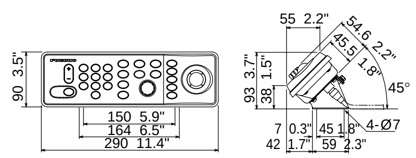
10.4" LCD (Flush Mount)

5.2 kg 11.5 lb



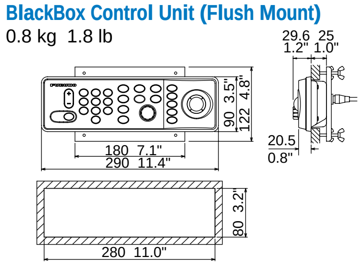
BlackBox Control Unit (Bracket Mount)

0.9 kg 2.0 lb



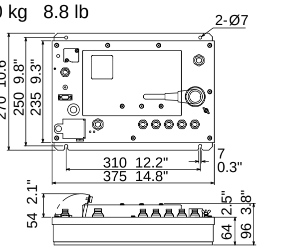
BlackBox Control Unit (Flush Mount)

0.8 kg 1.8 lb

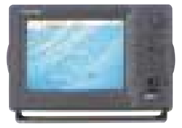


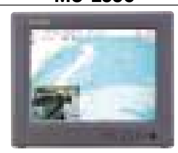
BlackBox Processor Unit

4.0 kg 8.8 lb

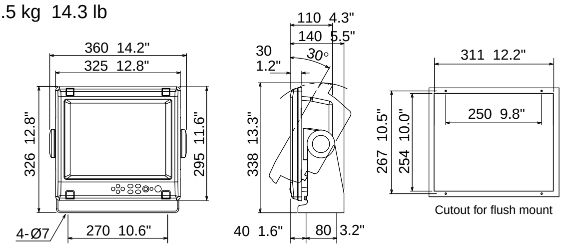


Specifications of NavNet vx2

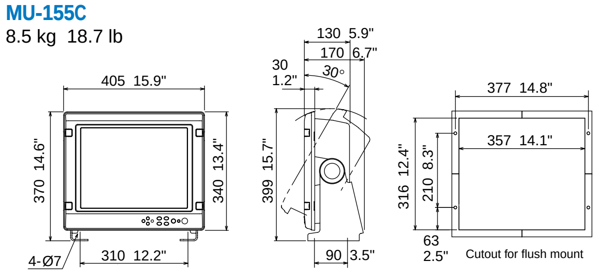
	Chart Plotter		BlackBox Chart Plotter
	GD-1720C	GD-1920C	GD-1920C-BB
			
DISPLAY UNIT			
1. Type	7" Color TFT LCD, VGA 480 x 640 pixels	10.4" Color TFT LCD 640 x 480 pixels	Multi-sync monitor Required (640 x 480 pixels)
2. NavNet Interface	Ethernet 10-BaseT		
3. Interface (NMEA 0183 format)	Input: DBT, DPT, DSC, DSE, GGA, GLL, HDG, HDM, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, VWT, VWR, WPL, ZDA, ZTG Output: AAM, APB, BOD, BWC, BWR, DBT, DPT, GGA, GLL, GTD, HDT, HDT, MTW, MWV, RMA, RMB, RMC, TLL, TTM, VHW, VTG, WPL, XTE, ZDA, ZTG		
PLOTTER CHARACTERISTICS			
1. Map Scale	0.125 to 2,048 nm		
2. Latitude Limits	Between 85°N and 85°S		
3. Plot Interval	1 s to 99 min 99 s or 0 to 99.99 nm		
4. Display Modes	Course plot, Nav data, Steering display, Highway		
5. Presentation Modes	TM/RM North-up, Course-up, Auto Course-up	TM/RM North-up, Course-up	
6. Memory Capacity	Up to 8,000 points for ship's track and marks, 999 waypoints, 35 quick points, 1 MOB, 200 planned routes (max. 35 waypoints/route), 1 quick route		
7. Alarms	Arrival/anchor watch, XTE, proximity alert, ship speed, depth*, water temperature*, fish*, grounding** (*Network Sounder required, temperature sensor required for water temperature alarm ** C-Map version only)		
8. Electronic Charts	C-Map NT MAX or Navionics® GOLD		
ENVIRONMENT (IEC 60945 test method)			
Temperature	-15°C to +55°C	-15°C to +55°C (Processor Unit, Control Unit)	
Waterproofing	IEC 60529 IPX5, USCG CFR-46	IEC 60529 IPX2, USCG CFR-46 (Processor Unit) IEC 60529 IPX5, USCG CFR-46 (Control Unit)	
POWER SUPPLY			
	12-24 VDC	12-24 VDC	12-24 VDC
	35 W	55 W	25 W
	115/230 VAC with optional rectifier PR-62/RU-3423		
Power Amp Unit	Not required		
Optional unit			
Autoplotter	Full control when networked with 10.4" LCD, BB system and ARP-11		
External Buzzer	OP03-136 or Relay/Contact Closure		
NTSC/PAL Interface kit	Not available	OP03-175	Supplied as standard
RGB Output Cable kit	Not available	OP03-176	
AIS Interface Unit	Available		

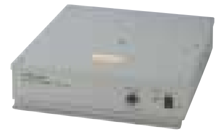
	Multi-purpose Marine LCD	
	MU-120C	MU-155C
		
DISPLAY UNIT		
Screen Size	12.1 inches, 246.0 x 184.5 mm	15 inches, 304.1 x 228.1 mm
Resolution	800 x 600 (SVGA)* * VGA up to SXGA signal is acceptable in analog RGB.	1024 x 768 (XGA)*
Contrast Ratio	300: 1	400:1
Viewing Angle — Vertical	+60° to -50°	+85° to -85°
Viewing Angle — Horizontal	left 70° to right 70°	left 85° to right 85°
Brightness	1000 cd/m²	
INTERFACE		
Analog RGB	2 ports, D-SUB/15 pins	
DVI	1 port, DVI-D	
Composite(RCA)	3 ports, RCA	
ENVIRONMENT (IEC 60945 test method)		
Temperature	-15°C to +55°C	
Waterproofing	IEC 60529 IPX5 (Front Panel)	
POWER SUPPLY		
	12-24 VDC 48 W(at 12 VDC)	12-24 VDC 84 W(at 12 VDC)

MU-120C
6.5 kg 14.3 lb

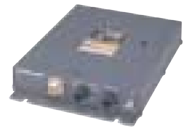


MU-155C
8.5 kg 18.7 lb

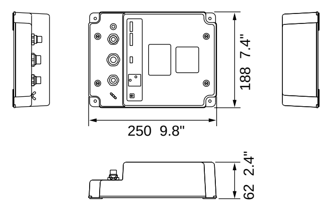


	Network Fish Finder	
	ETR-6/10N-BBFF1	ETR-30N-BBFF3
		
TRANSCEIVER & DISPLAY		
Display Modes	Single (50 or 200 kHz), Dual (50 and 200 kHz), Bottom-lock, Bottom Zoom, Bottom Discrimination, Marker Zoom, A-Scope	Single (Hi or Low frequency), Dual (both Hi and Low frequency) Bottom-lock, Bottom Zoom, Bottom Discrimination, Marker Zoom, A-Scope
Frequency	Dual frequency 50 kHz and 200 kHz	The synthesized transducer works with dual frequencies in 28 to 200 kHz
Output Power	600 W / 1 kW rms (Specify)	1, 2 or 3 kW (Specify)
Range Scale	8 basic ranges customized to max 1,200 m (4,000 ft, 650 fa)	Any ranges customized between 2 and 1500 m
Range Phasing	Up to 2,400 m (8,000 ft, 1,300 fa)	Up to 3000 m
ENVIRONMENT		
Temperature	-15°C to +55°C	-15°C to +55°C
Waterproofing	IEC 60529 IPX2	IEC 60529 IPX0
POWER SUPPLY		
	12-24 VDC	12-24 VDC
	11 W	30 W
TRANSDUCERS (Specify when ordering)		
	600 W 50/200 kHz: 520-5PSD (Plastic, thru-hull), 520-5MSD (Bronze, thru-hull), 520-5PWD (Plastic, transom), 525ST-MSD (Bronze, thru-hull with speed/temp sensor), 525ST-PWD (Plastic, transom with speed/temp sensor) **1 kW** (Optional Matching box MB-1000 required) 50 kHz: 50B-6, 50B-6G, 50B-6B, 50B-62M, 50B-9B, 50B-92M 200 kHz: 200B-5, 200B-5S 50/200 kHz: 50/200-1T, 50/200-12M	28 kHz: 28F-8, 28F-18, 50BL-24H, 28F-24H 50 kHz: 50B-6/6B, 50B-9/9B, 50F-8G, 50B-12, 50BL-12 88 kHz: 88B-8, 88B-10, 88F-126H 107 kHz: 100B-10R 200 kHz: 200B-5S, 200B-8/8B, 200B-8N, 200B-12H

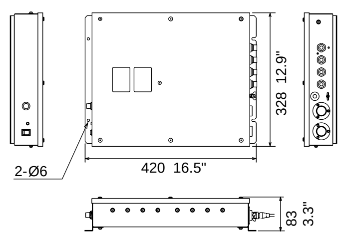
	GPS/WAAS Receiver Antenna
	GP-320B
	
RECEIVER CHARACTERISTICS	
Receiver Type	Twelve discrete channels, C/A code, all-in-view, WAAS
Receiver Frequency	L1 (1575.42 MHz)
Time to First Fix	12 s (warm start)
Tracking Velocity	999 kt
Geodetic Systems	WGS-84, NAD-27 and others
Accuracy	10 m (GPS) 3 m (WAAS)
ENVIRONMENT (IEC 60945 test method)	
Temperature	-25°C to +70°C
Waterproofing	IEC 60529 IPX6
POWER SUPPLY	
	12-24 VDC 1 W

	Network Weather Facsimile Receiver
	FAX-30
	
TRANSCEIVER CHARACTERISTICS	
Frequency Range	80 kHz to 160 kHz, 2 MHz to 25 MHz, 490 kHz, 518 kHz (NAVTEX)
Class of Emission	F3C, J3C, F1B (NAVTEX)
Receiving System	Double superheterodyne
Storage	Fax: 12 pictures, NAVTEX: 130 messages
ENVIRONMENT (IEC 60945 test method)	
Temperature	-15°C to +55°C
Waterproofing	IEC 60529 IPX2
POWER SUPPLY	
	12-24 VDC 12 W

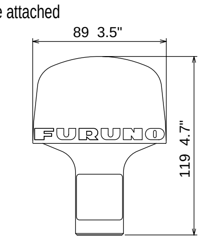
Network Fish Finder ETR-6/10N-BBFF1
1.5 kg 3.3 lb



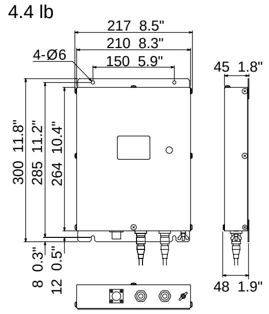
Network Fish Finder ETR-30N-BBFF3
5.6 kg 12.4 lb



GPS/WAAS Receiver Antenna GP-320B
0.8 kg 1.8 lb
10 m cable attached



Network Weather Facsimile Receiver FAX-30
2.0 kg 4.4 lb



Remote Controller
0.06 kg 0.1 lb

